

Task 8: Provide Clarity and Recommendations on PES Program Design Options

Discussion with PES Working Group
December 21, 2021

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Session Goal

- Provide some initial program details to consider
 - Created a "strawman" design to facilitate discussion
 - WG designs the program
- Solicit input from WG through Google survey form
 - Link will be in the chat

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Session Process

- Overview of "strawman" program design
 - Trying to develop "performance-based" soil health program
 - Numbers used are hypothetical and just for illustration
- Discuss pros and cons of major decisions
 - Limited time to cover a lot of decisions
 - Will provide an overview, present pros and cons, then discussion

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Overview of "Strawman" Program

- Farmer eligibility
 - Any commercial farm registered in the State of Vermont
- Land eligibility
 - Only land in the State of Vermont
 - Any field or fields, including pasture
 - No requirement to enroll whole farm

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Overview (cont'd)

- Soil health metrics
 - Organic matter
 - Bulk density
 - Aggregate stability
 - Biological diversity
- Quantification of metrics
 - Analysis of soil samples every 3 years
 - Samples used to calculate a soil health score
 - Use a modified CASH test for Vermont

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Overview (cont'd)

- Payment structure
 - Two-pronged payment structure
 1. Payment for current soil health score above thresholds
 2. Payment for improved soil health (relative to previous score)
 - Farmer can receive either or both payments concurrently

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Eligibility

- Farm eligibility
 - Classified as commercial farm in VT for at least 3 years.
 - Not in violation of any existing regulations issued by any relevant state and federal agencies
 - Including RAPs
- Land enrollment
 - Any field or fields (in Vermont) owned or with long-term agreement
 - No whole-farm requirement

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Individual Fields vs. Whole Farm

| Fields or Farm? | Pros | Cons |
|---|---|---|
| All fields (whole farm) required to enroll | <ul style="list-style-type: none"> • Gives a much bigger/better picture of SH on the farm • Could motivate some farmers to address SH more widely on farm • Eliminates intra-farm "leakage" issues | <ul style="list-style-type: none"> • Expensive: Sampling on all land takes time and money • Burden of all that sampling could reduce farmer participation |
| Individual fields eligible | <ul style="list-style-type: none"> • Only need to sample on fields that farmer wants to enroll • Farmers could enroll sets of fields in subsequent years, as they see fit | <ul style="list-style-type: none"> • Potential for payment is limited by # of acres enrolled |

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Individual Fields vs Whole Farm

- Initial recommendation
 - Individual fields are eligible
 - Fewer "leakage" issues for soil health (unlike P loss reduction)
 - e.g. manure not applied to one field will likely be applied to another field and add P loss
 - Reduced yield could cause less conservation on another field to increase yield.
 - Does the program need to ensure that field management is not getting worse on other farm fields? (by monitoring practices?)

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Quantification of Soil Health Scores

- Soil sampling according to a specific protocol (TBD)
 - Composite soil samples per field
 - Composite more representative than using one soil pit
 - Composite soil sample does not show root zone and soil profile as well as a pit
 - Sampling per field every 3 years
- Scoring Tool: Three primary choices
 - Cornell's Comprehensive Assessment of Soil Health (CASH)
 - Modified CASH Test for Vermont
 - A custom-built soil health test for Vermont

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Tool for Quantification

| Tool | Pros | Cons |
|--|--|--|
| Cornell CASH Test | <ul style="list-style-type: none"> • Science is already incorporated • Tries to make it inexpensive to calculate (but still is \$60/acre for cropland) | <ul style="list-style-type: none"> • Scores too high for VT soils • Does not use lab analysis for bulk density • Does not include bio diversity |
| Modified CASH (CASH used as basis for a VT version) | <ul style="list-style-type: none"> • Scores in correct ranges for VT • Would include bulk density test • Would include measure of soil biology • Would benefit from Cornell's previous research and efforts • This approach was piloted in 2021 on 200 fields | <ul style="list-style-type: none"> • Would require a team of VT soil scientists to design modifications (requires some \$ and time) |
| A new VT Soil Health Index Tool | <ul style="list-style-type: none"> • Would be custom built for VT and for use by this PES program • Per field costs would be lower in the long term | <ul style="list-style-type: none"> • Could be more time-intensive and costly to create • New tools always have kinks that need attention |

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Quantification of Soil Health Scores

- Initial recommendation
 - Modify the CASH test for use in Vermont
 1. Include lab test for bulk density
 2. Include a measure of biological diversity (not just microbial activity)
 - SH scores and thresholds consider soil type
 - CASH accounts for soil texture in scoring

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Payment Structure – Soil Health Payment

| Field # | Acres | SH Score | | | Soil Health Payment/Acre | | | Soil Health Payment/Field | | |
|--------------|-------|----------|-------|-------|--------------------------|-------|----------|---------------------------|----------|----------|
| | | T-0 | T-1 | T-2 | T-0 | T-1 | T-2 | T-0 | T-1 | T-2 |
| 1 | 15 | 100 | 100 | 100 | \$150 | \$150 | \$150 | \$2,250 | \$2,250 | \$2,250 |
| 2 | 30 | 90 | 95 | 98 | \$100 | \$150 | \$150 | \$3,000 | \$4,500 | \$4,500 |
| 3 | 45 | 80 | 86 | 88 | \$50 | \$100 | \$100 | \$2,250 | \$4,500 | \$4,500 |
| 4 | 60 | 70 | 80 | 86 | \$0 | \$50 | \$100 | \$0 | \$3,000 | \$6,000 |
| 5 | 75 | 60 | 70 | 80 | \$0 | \$0 | \$50 | \$0 | \$0 | \$3,750 |
| Total | 225 | | | | | | | \$7,500 | \$14,250 | \$21,000 |
| Weighted Avg | | 73.33 | 81.20 | 86.93 | | | \$/ac/yr | \$11 | \$21 | \$31 |
| | | | | | | | \$/ac | \$33 | \$63 | \$93 |

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Payment Structure –Payment for Improvement

| Field # | Acres | SH Score | | | Improvements in SH Score | | | Improvement Payment/Field | | |
|--------------|-------|----------|-------|-------|--------------------------|-----|-----|---------------------------|---------|---------|
| | | T-0 | T-1 | T-2 | T-0 | T-1 | T-2 | T-0 | T-1 | T-2 |
| 1 | 15 | 100 | 100 | 100 | | | | \$0 | \$0 | \$0 |
| 2 | 30 | 90 | 95 | 98 | | | | \$750 | \$450 | \$450 |
| 3 | 45 | 80 | 86 | 88 | | | | \$1,350 | \$450 | \$450 |
| 4 | 60 | 70 | 80 | 86 | | | | \$3,000 | \$1,800 | \$1,800 |
| 5 | 75 | 60 | 70 | 80 | | | | \$3,750 | \$3,750 | \$3,750 |
| Total | 225 | | | | | | | \$0 | \$8,850 | \$6,450 |
| Weighted Avg | | 73.33 | 81.20 | 86.93 | | | | \$0 | \$13 | \$10 |
| | | | | | | | | \$0 | \$39 | \$29 |

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Payment Structure – Total Payment

| Field # | Acres | SH Score | | | Soil Health Payment/Field | | | Improvement Payment/Field | | | Total Payment | | |
|--------------|-------|----------|-------|-------|---------------------------|----------|----------|---------------------------|---------|---------|---------------|----------|----------|
| | | T-0 | T-1 | T-2 | T-0 | T-1 | T-2 | T-0 | T-1 | T-2 | T-0 | T-1 | T-2 |
| 1 | 15 | 100 | 100 | 100 | \$2,250 | \$2,250 | \$2,250 | \$0 | \$0 | \$0 | \$2,250 | \$2,250 | \$2,250 |
| 2 | 30 | 90 | 95 | 98 | \$3,000 | \$4,500 | \$4,500 | \$750 | \$450 | \$450 | \$3,000 | \$5,250 | \$4,950 |
| 3 | 45 | 80 | 86 | 88 | \$2,250 | \$4,500 | \$4,500 | \$1,350 | \$450 | \$450 | \$2,250 | \$5,850 | \$4,950 |
| 4 | 60 | 70 | 80 | 86 | \$0 | \$3,000 | \$6,000 | \$3,000 | \$1,800 | \$0 | \$6,000 | \$7,800 | \$7,800 |
| 5 | 75 | 60 | 70 | 80 | \$0 | \$0 | \$3,750 | \$3,750 | \$3,750 | \$0 | \$3,750 | \$7,500 | \$7,500 |
| Total | 225 | | | | \$7,500 | \$14,250 | \$21,000 | \$0 | \$8,850 | \$6,450 | \$7,500 | \$23,100 | \$27,450 |
| Weighted Avg | | 73.33 | 81.20 | 86.93 | \$11 | \$21 | \$31 | \$0 | \$13 | \$10 | \$11 | \$34 | \$41 |
| | | | | | \$33 | \$63 | \$93 | \$0 | \$39 | \$29 | \$33 | \$103 | \$122 |

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Monitoring and Verification

- Current SH scores will be a result of how farmers have managed fields;
- Improvement in SH scores will be a result of how farmers **will have** managed their fields.
- Question: Is it important to verify that practices are being implemented as they should and are being maintained?
- Question: Should soil sampling be done by a third party?

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Input Needed

- Please take 10 minutes to give your input on these program design questions.
- Go to Google form survey here:
<https://forms.gle/mPNWGzyrVfjd94X8>
 - Link is in the chat

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